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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/810,387
Filing Date: March 15, 2001
Appellant(s): CARPENTER ET AL.

MAILED
MAR 12 2007
GROUP 1700

James E. Lake
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed September 5, 2006 appealing from the Office action mailed March 27, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner:

Claim 39 was finally rejected under 35 U.S.C. 103(a) as being unpatentable over Fukui et al (USPat. 5,002,928) in the office action of March 27, 2006. As noted by Applicant's Brief (Section III), claim 39 was cancelled in the amendment of January 9, 2006.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,747,367	POSA	5-1998
5,002,928	FUKUI	3-1991
4,319,737	WATERFIELD	3-1992
5,853,484	JEONG	12-1998

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 44 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant's claimed "showerhead" is not described in the specification.

Claim Rejections - 35 USC § 102/103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 41, 42, and 46 are rejected under 35 U.S.C. 102(b) as anticipated by Posa; John G. (USPat. 4,747,367) or, in the alternative, under 35 U.S.C. 103(a) as obvious over Posa; John G.

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(USPat. 4,747,367). Posa; John G. (USPat. 4,747,367). Posa teaches a chemical (56; Figure 1; column 5, lines 33-57) vapor deposition apparatus (Figure 4; column 7, line 57 - column 8, line 14) comprising: a deposition chamber (16; Figure 2,4; column 7, line 57 - column 8, line 14) having a lid (100; Figure 2; 300, Figure 4; column 7, line 57 - column 8, line 14); a valve body (100/300, 102, 114, 110, 112, 118, 120; Figure 4; column 6, lines 13-40) including a portion of the lid (100; Figure 2; 300, Figure 4; column 7, line 57 - column 8, line 14) as part of the valve body (100/300, 102, 114, 110, 112, 118, 120; Figure 4; column 6, lines 13-40), the valve body (100/300, 102, 114, 110, 112, 118, 120; Figure 4; column 6, lines 13-40) being adapted to receive external control signals (28; Figure 1; column 4, lines 56-65) selectively shutting off flow of a process chemical (56; Figure 1; column 5, lines 33-57) into the chamber (16; Figure 2,4; column 7, line 57 - column 8, line 14), adjusting the flow rate of the chemical (56; Figure 1; column 5, lines 33-57) into the chamber (16; Figure 2,4; column 7, line 57 - column 8, line 14), or both; and a valve stem (114; Figure 1) that moves inward to the chamber (16; Figure 2,4; column 7, line 57 - column 8, line 14) to allow or to increase flow of process chemical (56; Figure 1; column 5, lines 33-57) into the chamber (16; Figure 2,4; column 7, line 57 - column 8, line 14) and moves outward from the chamber (16; Figure 2,4; column 7, line 57 - column 8, line 14) to shut off or to decrease process chemical (56; Figure 1; column 5, lines 33-57) flow into the chamber (16; Figure 2,4; column 7, line 57 - column 8, line 14), as claimed by claim 41

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Posa is not clear in either Posa's specification or Posa's not-to-scale drawings as to the relative thickness of Posa's lid (100; Figure 2; 300, Figure 4; column 7, line 57 - column 8, line 14) and Posa's chamber body chamber (16; Figure 2,4; column 7, line 57 - column 8, line 14)¹.

Fuki is also not clear if his lid (top tapered portion of 14) is removable.

In the event that Posa is not deemed to anticipate Applicant's claimed invention of "similar thickness" between Posa's lid and Posa's chamber body, or that Posa is not deemed to anticipate Applicant's claimed invention of "cylindrical body":

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Posa to optimize the relative dimension of Posa's lid and Posa's chamber body.

Motivation for Posa to optimize the relative dimension of Posa's lid and Posa's chamber body is for scaling Posa's deposition apparatus to accommodate larger substrates. Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art. (Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); In re Rose, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

Claims 1, 2, 4-23, 25-29, and 46 are rejected under 35 U.S.C. 102(b) as anticipated by Fukui et al (USPat. 5,002,928) or, in the alternative, under 35 U.S.C. 103(a) as obvious over Fukui et al (USPat. 5,002,928). Fukui teaches a deposition apparatus (Figure 1) for depositing superconducting films (column 2, lines 14-36). Although Fukui does not discuss CVD (chemical vapor deposition) operations, it has been held that claim language that simply specifies an

¹ Proportions of features in a drawing are not evidence of actual proportions when drawings are not to scale. Because the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. However, the description of the article pictured can be relied on, in combination with the

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intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

Fukui further teaches a deposition chamber (14) defined partly by a chamber body (“solution-escaping inhibitor”; column 5, lines 1-2) including a lid² (top tapered portion of 14). Fukui further teaches a needle valve / isolation mechanism (6) that seals fluid flow between an outermost (outside chamber 14) and innermost (inside chamber 14) surface of the chamber body (14; column 4, lines 53-59). The lid (top tapered portion of 14) being integral to the isolation mechanism (6) such that the isolation mechanism (6) would be incomplete, nonfunctional, or otherwise not able to isolate material from reaching the chamber absent the lid (top tapered portion of 14). Fukui further teaches a part of the valve housing (inside surface of 7; Figure 1; column 4; lines 28-31, 36-39, 53-60) between the innermost (inside chamber 14) and outermost surfaces (outside chamber 14) of the chamber body (14; column 4; lines 28-31, 36-39, 53-60). Fukui further teaches the valve body (1) including a portion of the chamber body (14) as at least a part of the valve housing (column 4; lines 28-31, 36-39, 53-60). Fukui further shows, the valve body (1) having an entirety of a seat (inside surface of 7; Figure 1; column 4; lines 28-31, 36-39, 53-60) within the chamber lid (top tapered portion of 14). The seat (inside surface of 7; Figure 1; column 4; lines 28-31, 36-39, 53-60) forming a part of the chamber lid (top tapered portion of

drawings, for what they would reasonably teach one of ordinary skill in the art. (In re Wright, 193 USPQ 332 (CCPA 1977). MPEP 2125.

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14) or body. Fukui further teaches at least a part of the process chemical inlet (11) to the valve body (1) between the innermost and outermost surfaces of the chamber body, and wherein the chamber body (14) forms a part of a material inlet (11,12). Fukui further teaches the part of the valve housing (fitting in 14 for valve 1) comprised by the portion of the lid is defined by a cylindrical opening (conduit for stem 3; column 4, line 34) in the lid. The valve body (1) further comprising a stem (3) coincident with the central axis of the cylindrical opening at least partially within the cylindrical opening. Fukui further teaches:

- i. The entirety of the valve seat (inside surface of 7; Figure 1) is between an innermost surface of the lid inside the chamber and an outermost surface of the lid outside the chamber (Figure 1)
- ii. The part of the valve seat (6/7 interface) comprised by the portion of the lid is defined by a beveled and annular lid surface around a cylindrical opening through the lid, the valve body further comprising a plug (6) complementary to the beveled lid surface - see vertical and slanted tapering at the 6/7 interface in Figure 1
- iii. A deposition chamber (14) defined in part by a cylindrical chamber body and a single-piece with a circumference corresponding to a shape and a size of the chamber body (14) where it joins with the lid, the chamber body (14) size being selected to accommodate a semiconductor wafer (17) during CVD when such wafer is parallel to the lid (top tapered portion of 14) – claim 15
- iv. a deposition chamber (14) defined in part by a cylindrical body (14; “solution-escaping inhibitor”; column 5; lines 1-2) and a circular lid (top tapered portion of 14) matched to a

² Lid – 5: something that confines, limits, or suppresses - Merriam-Webster's Collegiate Dictionary - 10th Ed. p.671

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diameter of the cylindrical body (14; “solution-escaping inhibitor”; column 5; lines 1-2); an opening (7/6 interface) formed through a thickness of the lid (top tapered portion of 14), the opening (7/6 interface) defining at least a part of a valve seat (inside surface of 7; Figure 1); and a valve assembly (5-7) positioned to match a valve plug (6) or diaphragm with the valve seat (inside surface of 7; Figure 1) – claim 44

- v. A chemical vapor deposition apparatus (Figure 1) comprising a deposition chamber (14) defined in part by a cylindrical body and a circular lid (top tapered portion of 14) matched to a diameter of the cylindrical body (14; “solution-escaping inhibitor”; column 5; lines 1-2); an opening (conduit holding 6) formed through a thickness of the lid (top tapered portion of 14), the opening (conduit holding 6) defining at least a part of a valve seat (inside surface of 7; Figure 1); and a valve assembly (2-6; Figure 1) positioned to match a valve plug (6; Figure 1) or diaphragm with the valve seat (inside surface of 7; Figure 1), as claimed by claim 45

Fukui is not clear in either Fukui’s specification or Fukui’s not-to-scale drawings as to the relative thickness of Fukui’s lid and Fukui’s chamber body (see Figure 1)³. Fukui is further not clear as to whether Fukui’s deposition chamber (14) is defined in part by a “cylindrical body” (14; “solution-escaping inhibitor”; column 5; lines 1-2).

Fukui is also not clear if his lid (top tapered portion of 14) is removable.

In the event that Fukui is not deemed to anticipate Applicant’s claimed invention of “similar thickness” between Fukui’s lid and Fukui’s chamber body, or that Fukui is not deemed to anticipate Applicant’s claimed invention of “cylindrical body”:

³Proportions of features in a drawing are not evidence of actual proportions when drawings are not to scale. Because the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. However, the description of the article pictured can be relied on, in combination with the

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It would have been obvious to one of ordinary skill in the art at the time the invention was made for Fukui to optimize the relative dimension of Fukui's lid and Fukui's chamber body.

Motivation for Fukui to optimize the relative dimension of Fukui's lid and Fukui's chamber body is for scaling Fukui's deposition apparatus to accommodate plural nozzle structures as taught Fukui (column 3, lines 29-33). Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art. (Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

Claims 3, 37, 38, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukui et al (USPat. 5,002,928). Fukui is discussed above. Fukui does not teach that the relative dimensions between Fukui's seat, chamber lid thickness, and chamber lid width as shown by Fukui's Figure 1.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Fukui to optimize the relative dimensions of Fukui's seat, chamber lid thickness, and chamber lid width.

Motivation for Fukui to optimize the relative dimensions of Fukui's seat, chamber lid thickness, and chamber lid width is to provide for added structural integrity and/or to accommodate a requisite dimension of the substrate (17, Figure 1), further, for scaling Fukui's deposition apparatus to accommodate plural nozzle structures as taught Fukui (column 3, lines 29-33). Further, it is well established that changes in apparatus dimensions are within the level of

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ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04). Further, proportions of features in a drawing are not evidence of actual proportions when drawings are not to scale. Because the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. However, the description of the article pictured can be relied on, in combination with the drawings, for what they would reasonably teach one of ordinary skill in the art. (In re Wright,193 USPQ 332 (CCPA 1977). MPEP 2125.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukui et al (USPat. 5,002,928) in view of Waterfield (USPat. 4,319,737). Fukui is discussed above. However, Fukui does not teach a diaphragm valve. Waterfield teaches a diaphragm valve (Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Fukui to replace his needle valve with Waterfield's diaphragm valve.

Motivation for Fukui to replace his needle valve with Waterfield's diaphragm valve is to provide an alternate and equivalent valve for delivering process fluids.

Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Posa; John G. (USPat. 4,747,367) in view of Fukui et al (USPat. 5,002,928). Posa is discussed above. Posa does not teach a beveled lid (100; Figure 2; 300, Figure 4; column 7, line 57 - column 8, line 14) surface around a cylindrical opening (16; Figure 4) through the lid (100; Figure 2; 300, Figure 4; column 7, line 57 - column 8, line 14), the valve body (100/300, 102, 114, 110, 112, 118, 120; Figure 4;

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column 6, lines 13-40) further comprising a plug (112; Figure 2,4) complementary to the beveled lid (100; Figure 2; 300, Figure 4; column 7, line 57 - column 8, line 14) surface.

Fukui is discussed above. Fukui further teaches beveled and annular lid surface around a cylindrical opening through the lid, the valve body further comprising a plug (6) complementary to the beveled lid surface - see vertical and slanted tapering at the 6/7 interface in Figure 1

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the dimension of Posa's lid (100; Figure 2; 300, Figure 4; column 7, line 57 - column 8, line 14) surface around a cylindrical opening (16; Figure 4) as taught by Fukui.

Motivation to optimize the dimension of Posa's lid (100; Figure 2; 300, Figure 4; column 7, line 57 - column 8, line 14) surface around a cylindrical opening (16; Figure 4) as taught by Fukui is for optimizing flow rates through gas conduits as is known in the art. Further, it has been held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device (*Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), MPEP 2144.04).

Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukui et al (USPat. 5,002,928) in view of Jeong, Kyung Cheol (USPat. 5,853,484). Fukui is discussed above. Fukui further teaches a deposition apparatus as discussed above including a deposition chamber (14; Figure 1) defined in part by a cylindrical body and a circular lid (top tapered portion of 14) matched to a diameter of the cylindrical body; an opening (7; Figure 1) formed through a thickness of the lid, the opening defining at least in part of a valve seat (tapered 6/7 interface;

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Figure 1); a valve assembly (7) positioned to match a valve plug (6; Figure 1) or diaphragm with the valve seat (tapered 6/7 interface; Figure 1).

Fukui does not teach a distribution showerhead positioned to receive deposition gas from the opening when the valve assembly is in an open position.

Jeong teaches valve bodies (32-1; Figure 2) adapted to receive external control signals (22; Figure 2; column 3, lines 1-19) for delivering process gasses to Jeong's CVD chamber (10; Figure 2; column 2; lines 15-22). Jeong further teaches a gas distribution showerhead manifold (19; Figure 2) positioned to receive CVD deposition gases (abstract) from an opening (16; Figure 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Jeong's gas distribution showerhead to Fukui's deposition apparatus.

Motivation to add Jeong's gas distribution showerhead to Fukui's deposition apparatus is for achieving CVD film thickness uniformity as taught by Jeong (column 3; lines 11-15) in CVD operations.

(10) Response to Argument

Prior to addressing Applicant's arguments, the Examiner notes an editorial discrepancy in Applicant's Section VII. The prior section VI lists eight grounds of rejection to be reviewed on appeal. Applicant's argument section VII lists only five headings, not eight, for each ground of rejection enumerated in section VI. However, it is very clear to the Examiner, and Applicant, that arguments for the claim 43 rejection (not explicitly recited as a heading in Section VII) is incorporated in the arguments for the rejection of claims 41, 42, and 46. Likewise, it is very clear to the Examiner, and Applicant, that arguments for the claim 1-29, 37-40, 46 rejection (not

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explicitly recited as a heading in Section VII) is incorporated in the arguments for the rejection of claim 43.

With respect to Applicant's response (Sections VII.A, VII.B) to the Examiner's new matter rejection of claim 44 (1st paragraph rejection + specification objection) Applicant states:

“

The specification does not expressly state what means is used to accomplish the distribution of process chemical 102 shown in Fig. 1....In the discussion regarding Jeong, page 11 of the Office Action affirms that distribution showerheads in CVD apparatuses are very well known to those of ordinary skill. In addition, Appellant notes that U.S. Patent Publication 200410083959 published May 6, 2004 (hereinafter “Carpenter”) shows a deposition chamber apparatus 2 in Figs. 1 and 4 with very similar features flow patterns, and distribution of process gases 14 in comparison to the present specification.

“

and later...

“

In a sense, Appellant's amendment to the drawings and specification merely corrects the absence of conventional details or adds conventional subject matter that may be considered inherent. Amendments correcting obvious errors do not constitute new matter where those of ordinary skill recognize the existence of error as well as the appropriate correction.

“

In response, the Examiner notes that when such a critical structural element as a “shower head” is not described or even enumerated by the originally filed specification and drawings, there is

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then reason to believe that such an element is not enabled. Although shower heads are relatively common structural elements in the prior art, the prior art is explicit, in all occasions, as to what, why, and how this critical structural element interfaces with other critical structural elements to achieve desired results and thus “make and/or use the invention”. Such enablement in the prior art commonly occupies at least several sentences in the as-filed specification and includes a detail in the figure enumerating such. The present as-filed specification, figures, and claims *do not* support any such feature either explicitly or implicitly and would thus force the skilled artisan to considerable ambiguity as to how the claimed apparatus can be “made” and/or “used”. Further, in response to Applicant’s drawing and specification amendments of April 21, 2005 containing the disputed new matter, it is noted that the Examiner’s immediate reply (Final Rejection 7/26/5) expressly cites such amendments as containing new matter and requires Applicant to remove the new matter (see paragraph 1, page 2 of Final Rejection). The file history contains no reference whatsoever of a “showerhead” prior to Applicant’s September 27, 2004 addition of claim 44 containing the new matter not described in the specification, claims, and drawings as originally filed.

With respect to Applicant’s section VII.C, Applicant states:

“

The Office does not now allege and has not previously alleged disclosure or suggestion of the claimed single-piece lid. The Office Action does not provide any mention of the claimed limitation. Such failure is understandable since review of Posa fails to reveal any disclosure or suggestion of a single-piece lid. The Office's rejection of claim 46 requires substantial evidence

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establishing disclosure or suggestion of every claim limitation. Accordingly. Posa does not anticipate or render obvious the subject matter of claim 46.

“

In response, taking the Examiner's repeated assertion in his Final Rejection that Posa teaches a chemical vapor deposition apparatus (Figure 4; column 7, line 57 - column 8, line 14) comprising among other claimed elements “a lid (100; Figure 2; 300, Figure 4; column 7, line 57 - column 8, line 14)”, it is immediately apparent from Posa's Figure 2, and well aged drafting convention, that element 100, having *constant cross hatching* is a “single-piece” as Applicant's claim requires.

Applicant further states in the same section VII.C (page 11):

“

Also, page 4 of the Office Action acknowledges the failure of Posa to disclose or suggest the claimed lid having a thickness which is much less than a width of the lid. The lid thickness is also similar to the chamber body thickness.

“

In response, the extent of the Examiner's “acknowledgement” is written to read:

“

Posa is not clear in either Posa's specification or Posa's not-to-scale drawings as to the relative thickness of Posa's lid (100; Figure 2; 300, Figure 4; column 7, line 57 - column 8, line 14) and Posa's chamber body chamber (16; Figure 2,4; column 7, line 57 - column 8, line 14)⁴.

⁴Proportions of features in a drawing are not evidence of actual proportions when drawings are not to scale. Because the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. However, the description of the article pictured can be relied on, in combination with the

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“

As a result, the Examiner nowhere implies that there is a “failure” of Posa to disclose or suggest the claimed lid having a thickness which is much less than a width of the lid. In fact, as the Examiner suggests, because Posa’s drawings are not to scale, as are the majority of patent drawings, there is mere ambiguity as to the *relative dimensions* of drawn components thus lending support for a proper rejection under 102/103 as the Examiner details in the final rejection.

In response to the Examiner’s proposed modification of Posa’s apparatus dimensions as a result of Posa’s not to scale drawings, Applicant further states:

“

If a proposed modification of the prior art would render the prior art device or process “inoperable for its intended purpose” or change the principle of operation of the prior art invention being modified, then no suggestion or motivation exists to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959); MPEP § 2143.01.

“

In response, the Examiner does not see how optimizing Posa’s not disclosed apparatus dimensions such that Posa’s “lid having a thickness which is much less than a width of the lid” would render Posa’s apparatus inoperable. Further, the Examiner poses the question: How much is “much less”? 10% less, 10.1% less, 99.999% less? Thus, Applicant’s claim requirement of “a thickness which is much less than a width”, is at least broad and at most vague. Surely a

drawings, for what they would reasonably teach one of ordinary skill in the art. (*In re Wright*, 193 USPQ 332 (CCPA 1977). MPEP 2125.

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dimensional change in Posa's lid's width and thickness such that one dimension is "much less", say 0.1% less, would *not render* Posa's apparatus "inoperable". Additionally, such dimensional modifications are common in the wafer processing industry when different sized wafers are considered for processing depending on the reactor's geometry.

With respect to claims 1, 9, 15 and Fukui's apparatus, Applicant's section VII.D states:

“

However, needle valve holder 7 does not form part of fence 14. Needle valve holder 7 and fence 14 are separate and distinct components of the Fukui apparatus. Accordingly, claim 1 along with claims 2-8 and 37 depending therefrom are patentable over Fukui.

“ (page 13, 1st P)

and...

“

Appellant notes that fence 14 is not in any way related to isolation of feedstock in path 10 from being delivered into fence 14. Appellant also notes that fence 14 is not in any way integral to hollow needle valve 6.

“ (page 13, 2nd P)

and...

«

However, fence 14 of Fukui does not disclose the deposition chamber defined as in claim 15. Also, needle valve holder 7 and wave sprayer 1 do not include fence 14 as a part of the valve body.

«

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and...

“

Regardless of the Office's allegation that the Fukui conduit holding hollow needle valve 6 discloses the claimed opening and that fence 14 discloses the claimed lid, the sidewalls of the conduit do not form a part of fence 14. Instead, the sidewalls form a part of needle valve holder 7.

“ (page 14, 2nd P)

As recited in the Final Rejection, Fukui teaches a deposition apparatus (Figure 1) for depositing superconducting films (column 2, lines 14-36). Fukui further teaches a deposition chamber (14) defined partly by a chamber body (“solution-escaping inhibitor”; column 5, lines 1-2) including a lid⁵ (top tapered portion of 14). Fukui further teaches a needle valve / isolation mechanism (6) that seals fluid flow between an outermost (outside chamber 14) and innermost (inside chamber 14) surface of the chamber body (14; column 4, lines 53-59). Although Fukui (and the remaining foreign inventors and assignee) refers to element 14 as a “fence”, it is noted that the definition⁶ of and the context that Fukui is applying element 14 suggests an liquid/gas impermeable surface. Indeed, if Fukui's element 14 were a conventional “fence”, then his process would spray fluids in all directions outside of element 14 rendering Fukui's apparatus inefficient if not inoperable. Further, the Examiner remains convinced that Fukui's needle valve holder (7) and chamber (14) are part and parcel part of the same unitary structure. The reason the Examiner believes that Fukui's needle valve holder (7) and chamber (14) are part and parcel part of the same unitary

⁵ Lid – 5: something that confines, limits, or suppresses - Merriam-Webster's Collegiate Dictionary - 10th Ed. p.671

⁶ fence – n: 1. a means of protection. 2. a barrier intended to prevent escape or intrusion or to mark a boundary. Merriam-Webster's Collegiate Dictionary - 10th Ed. p.428.

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structure is for two reason's: First, Fukui's invention is the valving arrangement above chamber 14. As such the Examiner believes that the draftsman and inventors *emphasized* this portion of Figure 1 to illustrate such, and *deemphasized* other facets of the invention that are important but detracted from the valving arrangement. The Examiner's position is supported by the fact that Fukui's specification dedicates the overwhelming majority of the specification and figure elements to the valving components. As a result, Fuikui's chamber 14 thickness (drawn as a line) is really the identical dimension (however deemphasized) as Fukui's element 7. Second, Fukui details a gas inlet 11 interfacing with element 7. If Fukui's element 7 were indeed separate from his chamber 14, suggesting a screw-on action, then conduit 11 would necessarily have to break off from 7 in order to remove Fukui's element 7 from chamber 14.

With respect to claim 44, Applicant's Section VII.E response follows (starting at page 15):

“

Appellant notes that columns 3 and 4 of Fukui expressly describe the ultrasonic wave sprayer in Fig. 1 as being limited to spraying solutions. As described in column 5, the advantages of Fukui are obtained by spraying solution directly from the solution-atomizing nozzle of the ultrasonic wave sprayer to substrate 17 to provide a uniform thin film. In contrast, claim 44 sets forth a distribution showerhead to receive deposition gas from the opening through the lid. Accordingly, the Office's proposed modification is to add the Jeong gas distribution manifold 19 to Fukui such that Jeong's manifold 19 receives the solution from needle valve holder 7 and then applies it to substrate 17.

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In response to applicant's suggestion that Fukui is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Fukui is both in the field of applicant's endeavor (deposition apparatus - column 7, line 57 - column 8, line 14) and is reasonably pertinent to the particular problem with which the applicant was concerned – fluid distribution in deposition apparatus.

Further, as discussed above, Applicant's "showerhead" is new matter and is not supported by the specification as originally filed. Furthermore, the Examiner asserts in his art-based rejection of claim 44 that Fukui does not teach a distribution showerhead positioned to receive deposition gas from the opening when the valve assembly is in an open position. And that Jeong teaches valve bodies (32-1; Figure 2) adapted to receive external control signals (22; Figure 2; column 3, lines 1-19) for delivering process gasses to Jeong's CVD chamber (10; Figure 2; column 2; lines 15-22). Jeong further teaches a gas distribution showerhead manifold (19; Figure 2) positioned to receive CVD deposition gases (abstract) from an opening (16; Figure 2). Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add Jeong's gas distribution showerhead to Fukui's deposition apparatus. And motivation to add Jeong's gas distribution showerhead to Fukui's deposition apparatus is for achieving CVD film thickness uniformity as taught by Jeong (column 3; lines 11-15) in CVD operations.

With respect to the Examiner's proposed combination, Applicant states:

“

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Understandably, such a modification entirely changes the method by which Fukui applies the atomized solution. Further, no evidence exists or is alleged to exist that Jeong's manifold 19 is suitable to use for creating an atomized solution and/or will still provide the advantages required by Fukui. Jeong's manifold 19 is designed to distribute gas. If a proposed modification of the prior art would render the prior art device or process "inoperable for its intended purpose" or change the principle of operation of the prior art invention being modified, then no suggestion or motivation exists to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959); MPEP § 2143.01. Accordingly, no motivation may be considered to exist to modify Fukui in the manner alleged and the cited combination fails to disclose every limitation of claim 44.

“

In response, the Examiner believes that Fukui's apparatus would remain operable in the proposed combination due to the fact that both apparatus process *fluids*. In particular, Fukui's apparatus processes both liquids (via conduits 9,11) and gases (via conduit 12). Further, Applicant's rationale for the combination being “no evidence exists or is alleged to exist that Jeong's manifold 19 is suitable to use for creating an atomized solution and/or will still provide the advantages required by Fukui” is *not* the Examiner's expressly stated rational for the combination:

“

Motivation to add Jeong's gas distribution showerhead to Fukui's deposition apparatus is for achieving CVD film thickness uniformity as taught by Jeong (column 3; lines 11-15) in CVD operations.

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”

In response to applicant's argument that “no evidence exists or is alleged to exist that Jeong's manifold 19 is suitable to use for creating an atomized solution and/or will still provide the advantages required by Fukui”, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Further, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Rudy Zervigon (Primary Examiner, Art Unit 1763)



Conferees:

Parviz Hassanzadeh (SPE, Art Unit 1763)



Gregory Mills (QAS, TC 1700)

